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10/593,872

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EXAMINER

LEE, NATHANIEL J.

ART UNIT

PAPER NUMBER

2889

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/593,872 | Applicant(s) FUJITA ET AL. | |
| | Examiner NATHANIEL J. LEE | Art Unit 2889 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on July 6, 2009 under 37 CFR 1.312 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.
3. Applicant's substitute specification and abstract are entered and overcome all objections made thereto. The title was indeed spelled correctly in the application as filed; the error the examiner cited in the previous action was in the pre-grant publication of the application, not in the application itself.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 13 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Celikkaya et al. (US 2005/0056055 A1), hereinafter Celikkaya.

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6. With respect to claim 13: Celikkaya discloses “a crystallized glass (paragraphs 119-121) comprising: Ce^{3+} (paragraph 121); and a precipitated garnet crystal (paragraph 120)”.

7. With respect to claim 14: Celikkaya discloses “wherein the garnet crystal is YAG crystal or YAG crystalline solid solution (paragraph 120)”.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 4-6, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeh et al. (US 2001/0000622 A1), hereinafter Reeh, in view of Celikkaya.

10. With respect to claim 1: Reeh teaches “a phosphor (6 (Fig. 3)) comprising: an inorganic material (paragraph 51); wherein when an excitation light (paragraph 109) including visible light (paragraph 109) is irradiated on the phosphor (paragraph 109), the phosphor emits a fluorescence of complimentary color with respect to a hue of the excitation light (paragraph 109), and a portion of the excitation light transmits through the phosphor (paragraph 109)”.

11. Reeh does not teach “a crystallized glass”.

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12. However, Celikkaya teaches “a crystallized glass (paragraphs 119-121)” comprising precipitated yttrium aluminum crystallites which may be doped with Ce and are therefor analogous to Reeh's phosphor particles (Celikayya paragraph 121).

13. It would have been obvious at the time of the invention for one of ordinary skill in the art to modify the phosphor of Reeh with the crystallized glass taught by Celikayya in order to increase its strength (Celikkaya paragraph 112).

14. With respect to claim 2: Reeh teaches “wherein the phosphor has a panel shape (see Fig. 3)”.

15. With respect to claim 4: Reeh teaches “wherein the excitation light including visible light is a light of which a center wavelength is between 430 to 490nm (paragraph 109), and the fluorescence is a light of which a center wavelength is between 530 to 590nm (paragraph 109)”.

16. With respect to claim 5: Celikkaya teaches “wherein the crystallized glass including includes Ce^{3+} (paragraph 121) and a precipitated garnet crystal (paragraph 121)”.

17. The motivation to combine is the same as in claim 1 above.

18. With respect to claim 6: Celikkaya teaches “wherein the garnet crystal is YAG crystal or YAG crystalline solid solution (paragraph 121)”.

19. The motivation to combine is the same as in claim 1 above.

20. With respect to claim 11: Reeh teaches “a light-emitting diode (1 (Fig. 3)) utilizing the phosphor according to claim 1 (6 (Fig. 3))”.

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21. With respect to claim 12: Reeh teaches “a light-emitting diode (1 (Fig. 3)) comprising: a stem (2, 3 (Fig. 3)) including a cathode lead terminal (3 (Fig. 3)) and an anode lead terminal (2 (Fig. 3)), a light-emitting diode chip (1 (Fig. 3)) connected to the anode lead terminal (see Fig. 3), a metal wire connecting the cathode lead terminal and the light-emitting diode chip (14 (Fig. 3)), a housing vessel (8 (Fig. 3)) that is fixed such that the stem and the light-emitting diode chip are air- tightly sealed (paragraphs 92-93), and including a window portion (see Fig. 3) disposed above the light-emitting diode chip (see Fig. 3), and the phosphor according to claim 1 (6 (Fig. 3)) attached to the window portion of the housing vessel (see Fig. 3)”.

22. Claims 3, and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeh in view of Celikkaya as applied to claims 1, 2, 5 above, and further in view of Maegawa (US 2002/0171911 A1), hereinafter Maegawa.

23. With respect to claim 3: Reeh and Celikkaya do not specifically teach “wherein the phosphor has a wall thickness between 0.1 mm to 2 mm”.

24. However, Maegawa teaches a YAG:Ce phosphor (paragraph 11) used in an LED in a manner similar to Reeh “wherein the phosphor has a wall thickness between 0.1 mm to 2 mm (paragraph 11)”.

25. It would have been obvious at the time of the invention for one of ordinary skill in the art to form the phosphor taught by Reeh in view of Celikkaya to the thickness taught by Maegawa in order to adjust the hue of the LED in order to obtain white light (Maegawa paragraph 11).

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26. With respect to claim 7: Reeh and Celikkaya do not specifically teach “further including 0.01 to 5 mol% of Ce_2O_3 ”.

27. However, Maegawa teaches a YAG:Ce phosphor (paragraph 11) used in an LED in a manner similar to Reeh “further including 0.01 to 5 mol% of Ce_2O_3 (paragraph 24)”.

28. It would have been obvious at the time of the invention to further modify the phosphor of Reeh in view of Celikkaya with the cerium concentration taught by Maegawa in order to activate the phosphor (Maegawa paragraph 24).

29. With respect to claim 8: Reeh does not teach “wherein the crystallized glass has a glass composition including 10 to 60mol% of $\text{SiO}_2 + \text{B}_2\text{O}_3$, 15 to 50mol% of $\text{Al}_2\text{O}_3 + \text{GeO}_2 + \text{Ga}_2\text{O}_3$, 5 to 30mol% of $\text{Y}_2\text{O}_3 + \text{Gd}_2\text{O}_3$, 0 to 25mol% of Li_2O , 0 to 15mol% of $\text{TiO}_2 + \text{ZrO}_2$, and 0.01 to 5mol% of Ce_2O_3 ”.

30. Celikkaya teaches “wherein the crystallized glass has a glass composition including 10 to 60mol% of $\text{SiO}_2 + \text{B}_2\text{O}_3$ (paragraph 14), 15 to 50mol% of $\text{Al}_2\text{O}_3 + \text{GeO}_2 + \text{Ga}_2\text{O}_3$ (paragraph 14), 5 to 30mol% of $\text{Y}_2\text{O}_3 + \text{Gd}_2\text{O}_3$ (paragraph 123), 0 to 25mol% of Li_2O (paragraph 91), 0 to 15mol% of $\text{TiO}_2 + \text{ZrO}_2$ (paragraph 92)”.

31. Maegawa teaches “0.01 to 5mol% of Ce_2O_3 (paragraph 24)”.

32. It would have been obvious at the time of the invention to modify the phosphor of Reeh with the crystallized glass composition of Celikkaya in order to increase its strength (Celikkaya paragraph 112) and to add cerium in the amount taught by Maegawa in order to activate the phosphor (Maegawa paragraph 24).

33. With respect to claim 9: Celikkaya teaches “further including essentially no TiO_2 and ZrO_2 (paragraph 6)”.

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34. Note: Celikkaya specifies that the TiO_2 and ZrO_2 are optional, which means that leaving them out is also an option.

35. The motivation for using Celikkaya's crystallized glass composition is the same as in claim 8 above.

36. With respect to claim 10: Reeh does not teach "wherein the crystallized glass has a glass composition including 10 to 50mol% of SiO_2 , 15 to 45mol% of Al_2O_3 , 5 to 30mol% of Y_2O_3 , 0 to 15mol% of GeO_2 , 0 to 20mol% of Gd_2O_3 , 0 to 15mol% of Li_2O , 0 to 30mol% of $\text{CaO} + \text{MgO} + \text{Sc}_2\text{O}_3$, and 0.01 to 5mol% of Ce_2O_3 ".

37. Celikkaya teaches "wherein the crystallized glass has a glass composition including 10 to 50mol% of SiO_2 (paragraph 14), 15 to 45mol% of Al_2O_3 (paragraph 14), 5 to 30mol% of Y_2O_3 (paragraph 123), 0 to 15mol% of GeO_2 (paragraph 58), 0 to 20mol% of Gd_2O_3 (paragraph 121), 0 to 15mol% of Li_2O (paragraph 91), 0 to 30mol% of $\text{CaO} + \text{MgO} + \text{Sc}_2\text{O}_3$ (paragraph 91)".

38. Note: Any optional ingredients taught by Celikkaya (everything except the SiO_2 and Al_2O_3) is embodied at least by the 0 mol% case, as well as any other specific embodiments taught by Celikkaya.

39. Maegawa teaches "0.01 to 5mol% of Ce_2O_3 (paragraph 24)".

40. It would have been obvious at the time of the invention to modify the phosphor of Reeh with the crystallized glass composition of Celikkaya in order to increase its strength (Celikkaya paragraph 112) and to add cerium in the amount taught by Maegawa in order to activate the phosphor (Maegawa paragraph 24).

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41. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celikkaya as applied to claim 13 above, and further in view of Maegawa.

42. With respect to claim 15: Celikkaya does not specifically teach “further including 0.01 to 5 mol% of Ce_2O_3 ”.

43. However, Maegawa teaches YAG “further including 0.01 to 5 mol% of Ce_2O_3 (paragraph 24)”.

44. It would have been obvious at the time of the invention for one of ordinary skill in the art to modify the crystallized glass of Celikkaya with the cerium concentration taught by Maegawa in order to activate the YAG crystals so that they may be used as a phosphor (Maegawa paragraph 24).

45. With respect to claim 16: Celikkaya teaches “further including a glass composition including 10 to 60mol% of $\text{SiO}_2 + \text{B}_2\text{O}_3$ (paragraph 14), 15 to 50mol% of $\text{Al}_2\text{O}_3 + \text{GeO}_2 + \text{Ga}_2\text{O}_3$ (paragraph 14), 5 to 30mol% of $\text{Y}_2\text{O}_3 + \text{Gd}_2\text{O}_3$ (paragraph 123), 0 to 25mol% of Li_2O (paragraph 91), 0 to 15mol% of $\text{TiO}_2 + \text{ZrO}_2$ (paragraph 92)”.

46. Celikkaya does not teach “and 0.01 to 5mol% of Ce_2O_3 ”.

47. However, Maegawa teaches YAG doped with “0.01 to 5mol% of Ce_2O_3 (paragraph 24)”.

48. The motivation to combine is the same as in claim 15 above.

49. With respect to claim 17: Celikkaya teaches “further including essentially no TiO_2 and ZrO_2 (paragraph 6)”.

50. Note: Celikkaya specifies that the TiO_2 and ZrO_2 are optional, which means that leaving them out is also an option.

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51. With respect to claim 18: Celikkaya teaches “further including a glass composition including 10 to 50 mol% of SiO₂ (paragraph 14), 15 to 45mol% of Al₂O₃ (paragraph 14), 5 to 30mol% of Y₂O₃ (paragraph 123), 0 to 15mol% of GeO₂ (paragraph 58), 0 to 20mol% of Gd₂O₃ (paragraph 121), 0 to 15mol% of Li₂O (paragraph 91), 0 to 30mol% of CaO + MgO + Sc₂O₃ (paragraph 91)”.
52. Note: Any optional ingredients taught by Celikkaya (everything except the SiO₂ and Al₂O₃) is embodied at least by the 0 mol% case, as well as any other specific embodiments taught by Celikkaya.
53. Maegawa teaches “0.01 to 5mol% of Ce₂O₃ (paragraph 24)”.
54. The motivation to combine is the same as in claim 15 above.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHANIEL J. LEE whose telephone number is (571)270-5721. The examiner can normally be reached on Monday-Thursday, 8:00 a.m.-5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 2889

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